Optimal Well Placement Techniques in Low Contrast Clastic Reservoirs: Utilizing Integrated Technologies and Real-Time Data to Minimize Uncertainly in Challenging Low Contrast Clastic Reservoirs

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Abstract

The Nong Yao Field is located in the southern Gulf of Thailand, approximately 145km off the coast, in approximately 75m of water. The Nong Yao Field covers the Southern margin of Pattani Basin and the North West border of the Malay Basin. It was discovered by the well Nong Yao – 1 exploration well in 2009 (Figure 1). The key subsurface challenges and uncertainties in the Nong Yao clastic reservoirs were: limited exploration and appraisal data, extent of aquifer support, faulted and compartmentalized reservoirs, lateral sand connectivity, thin oil columns, fluid contact, low contrast pays and geological structure. The strategy to develop the Nong Yao Field was via horizontal wells in order to maximize the reservoir exposure in thin sand reservoir in order to optimize the field production. This paper will cover some of the techniques used in placing the horizontal wells, which include utilizing technologies to overcome difficulties, minimizing uncertainties, dealing with reservoirs of low contrast and integrating and using data in real-time for better decision making.

The Nong Yao development methodology and well placement techniques provide a model strategy for how development can be approached in order to reduce overall development costs, in turn making more reservoirs viable to develop. The integrated approach to the use of technology, planning techniques and well placement techniques in challenging environments, sets a benchmark for clastic reservoir development in the Gulf of Thailand. The value and impact to Thailand's Oil and Gas Industry is significant, as it has the potential to unlock more reservoirs in the Gulf of Thailand for development in the current cost pressure and oil price environment.